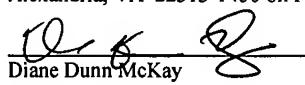




Docket No.: 4555-118 US

The undersigned certifies that this communication is being deposited with the United States Postal Service as prepaid first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 5, 2004.

  
Diane Dunn McKay

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:
HAPPER et al.	:
Serial No.: 10/620,159	: Group Art Unit: TBD
Filed: July 15, 2003	: Examiner: TBD
Title: METHOD AND SYSTEM FOR OPERATING AN ATOMIC CLOCK WITH REDUCED SPIN-EXCHANGE BROADENING OF ATOMIC CLOCK RESONANCES	: x

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, Applicant hereby brings to the attention of the United States Patent and Trademark Office the following documents of which Applicant has been made aware. The documents are listed on the attached PTO Form 1449. Copies of the documents are enclosed.

Applicant submits that this Information Disclosure Statement is submitted prior to a first action on the merits.

It is requested that the references be considered by the Examiner and be made of record as part of the available prior art under 37 C.F.R. § 1.104.

Respectfully submitted,

  
Diane Dunn McKay  
Reg. No. 34,586  
Attorney for Applicant

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**INFORMATION DISCLOSURE CITATION**
*(Use several sheets if necessary)*

Docket Number (Optional)

**4555-118US**

Application Number

**10/620,159**

Applicant(s)

**HAPPER et al.**

Filing Date

**July 15, 2003**

Group Art Unit

**TBD**
**U.S. PATENT DOCUMENTS**

<b>*EXAMINER INITIAL</b>	<b>REF</b>	<b>DOCUMENT NUMBER</b>	<b>DATE</b>	<b>NAME</b>	<b>CLASS</b>	<b>SUBCLASS</b>	<b>FILING DATE IF APPROPRIATE</b>
		<b>4,122,408</b>	<b>10/24/1978</b>	<b>WALLS</b>	<b>331</b>	<b>3</b>	
		<b>4,425,653</b>	<b>01/10/1984</b>	<b>CUTLER</b>	<b>372</b>	<b>70</b>	
		<b>4,476,445</b>	<b>10/09/1984</b>	<b>RILEY, Jr.</b>	<b>331</b>	<b>3</b>	
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		<b>4,943,955</b>	<b>07/24/1990</b>	<b>RABIAN et al.</b>	<b>368</b>	<b>156</b>	
		<b>5,379,000</b>	<b>01/03/1995</b>	<b>BREWER et al.</b>	<b>331</b>	<b>3</b>	
		<b>6,157,261</b>	<b>12/05/2000</b>	<b>AUDOIN et al.</b>	<b>331</b>	<b>3</b>	
		<b>5,606,291</b>	<b>02/25/1997</b>	<b>VERBANETS</b>	<b>331</b>	<b>3</b>	
		<b>5,642,625</b>	<b>07/01/1997</b>	<b>CATES, Jr et al.</b>	<b>62</b>	<b>55.5</b>	
		<b>5,657,340</b>	<b>08/12/1997</b>	<b>CAMPARO et al.</b>	<b>372</b>	<b>69</b>	
		<b>5,852,386</b>	<b>12/22/1998</b>	<b>CHANTRY et al.</b>	<b>331</b>	<b>94.1</b>	

**FOREIGN PATENT DOCUMENTS**

<b>REF</b>	<b>DOCUMENT NUMBER</b>	<b>DATE</b>	<b>COUNTRY</b>	<b>CLASS</b>	<b>SUBCLASS</b>	<b>Translation</b>	
						<b>YES</b>	<b>NO</b>

**OTHER DOCUMENTS** *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	<b>S. Appelt, A. Ben-Amar Baranga, C.J. Erickson, M.V. Romalis, A.R. Young, and W. Happer, Theory of spin-exchange optical pumping of 3He and 129Xe, Phys. Rev. A 58, 1412-1439, Issue 2, August 1998.</b>
	<b>Hyatt M. Gibbs and Robert J. Hull, Spin-Exchange Cross Sections for Rb87-Rb87-Cs133 Collisions, Phys. Rev. 153, 132-151, Issue 1, 5 January 1967.</b>

**EXAMINER****DATE CONSIDERED**

**EXAMINER:** Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<b>INFORMATION DISCLOSURE CITATION</b> <small>(Use several sheets if necessary)</small>				Docket Number (Optional) <b>455-118US</b>		Application Number <b>10/620,159</b>	
				Applicant(s) <b>HAPPER et al.</b>			
				Filing Date <b>July 15, 2003</b>		Group Art Unit <b>TBD</b>	
<b>U.S. PATENT DOCUMENTS</b>							
*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		<b>6,025,755</b>	<b>02/15/2000</b>	<b>CAMPARO</b>	<b>331</b>	<b>3</b>	
		<b>6,303,928 B1</b>	<b>10/16/2001</b>	<b>BUELL et al.</b>	<b>250</b>	<b>251</b>	
		<b>6,426,679 B1</b>	<b>07/30/2002</b>	<b>OBLAK et al.</b>	<b>331</b>	<b>3</b>	
		<b>6,518,092 B2</b>	<b>02/11/2003</b>	<b>KIKUCHI</b>	<b>438</b>	<b>107</b>	
<b>FOREIGN PATENT DOCUMENTS</b>							
REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
						YES	NO
<b>OTHER DOCUMENTS</b> <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>							
		<b>Bell, William E., Bloom, Arnold L., optical Detection of Magnetic Resonance in Alkali Metal Vapor, Phys. Rev. 107, 1559-1556, Issue 6, September 1957.</b>					
		<b>Walter, D.K., Griffith, W.M. and Happer, W., Magnetic Slowing Down of Spin Relaxation due to Binary Collisions of Alkali-Metal Atoms with Buffer-Gas Atoms, Phys. Rev. Lett. 88, 093004 (2002).</b>					
EXAMINER				DATE CONSIDERED			
<b>EXAMINER:</b> Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

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Docket Number (Optional) <b>4555-118US</b>	Application Number <b>10/620,159</b>
Applicant(s) <b>HAPPER et al.</b>	
Filing Date <b>July 15, 2003</b>	Group Art Unit <b>TBD</b>

*EXAMINER INITIAL	OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>
	Ressler, N.W., Sands, R.H., Stark, T.E., Measurement of Spin-Exchange Cross Sections for Cs133, Rb87, Rb85, K39, and Na23, Phys. Rev. 184, 102-118, Issue 1, August 1969
	Anderson, L.W and Baird, James C., N14-N15 Hyperfine Anomaly, Phys. Rev. 116, 87-98, Issue 1, October 1959
	Srinivasa, K. and Rajeswari, V., Quantum Theory of Angular Momentum: Selected Topics, Published by Springer-Verlag and Narosa Publishing House (1993)
	Appelt, S, Ben-Amar Baranga, Young, A. R., Happer, W., Light narrowing of rubidium magnetic-resonance lines in high-pressure optical-pumping cells, Physical Review A, Volume 59, Number 3, pp. 2078-2084.
EXAMINER	DATE CONSIDERED

\*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.